**Course Content**

**PART (1): UNCERTAINTY ANALYSIS**

1. **ASME measurement uncertainty**
2. **Uncertainty propagation**
3. **Planning of experiment**

**REFERENCES**

1. **Coleman, h. AND Steele, W. “Engineering Application of Experimental Uncertainty Analysis” AIAA Vol.33, No. 10, Oct 1995.**
2. **Moffat, R. “Using Uncertainty Analysis in Planning of an Experiment” ASME Journal of Fluids Engineering, Vol. 107, June 1985.**
3. **Phillips, S, D., Estler, W.T., Levenson, M.S. and Eberhardt, K.R.” Calculation of Measurement Uncertainty Using Prior Information” Journal of National Institute of Standards and Technology, Vol. 103, No.6, Nov. 1998**

**PART (2): DESIGN AND ANALYSIS OF EXPERIMENT**

1. **Comparative experiment**
2. **Hypothesis testing**
3. **Analysis of variance**
4. **Factorial experiment**

**REFERENCE**

**Montgomery, D.” Design and Analysis of Experiments” 6th edition John Wiley 2005**

**PART (3): RANDOM DATA ANALYSIS**

1. **Random Signal Analysis: Time domain analysis; RMS, Probability density function, Auto and Cross correlation function. Frequency domain analysis; Power spectrum, power spectral density, Cross spectral density.**
2. **Digital Data Processesing: Filtering and digital sampling; Windowing, FFT and aliasing.**
3. **Introduction to Data Acquisition Systems: LABVIEW and ELVIS**
4. **Application of Random Signals in Mechanical Engineering**

**REFERENCE**

**Bendit, J. and Peirsol, A.” Random Data: Analysis and Measurement Procedure” 2nd edition, Jhon Wiley, 1986**

**Newland, D.E. “An Introduction to Random Vibration, spectral and Wavelet Analysis” 3rd Edition, Longman Scientific and Technical 1994.**

**Course Evaluation:**

**CLASS WORK**

**Lab. Work: 10%; Class Work: 10%;**

**EXAMINATIONS**

**Two Mid Term Examination: 40%; Final Examination : 40%**